

NOTES ON THE LACEBUG GENUS ILDEFONSUS DISTANT, WITH DESCRIPTION OF A NEW SPECIES (HEMIPTERA, TINGIDAE) FROM CHINA

LI Chuan-Ren¹, ZHENG Le-Yi²

1. College of Agriculture, Yangtze University, Jingzhou, Hubei 434025, China

2. College of Life Sciences, Nankai University, Tianjin 300071, China

Abstract The Oriental lacebug genus, *Ildefonsus* Distant is redefined by adding some characters in cephalic spines, metathoracic scent gland and genitalia, and is verified as a well defined genus. Three species in Chinese fauna are dealt with, of which, *Ildefonsus distanti* is described as new to science, *Ildefonsus nexus* Drake et Ruhoff is firstly recorded from China. A species list and a key to the known species of the genus are given. The type materials of the new species are deposited in the Insect Collection of Nankai University, Tianjin, China.

Key words Hemiptera, Tingidae, *Ildefonsus* Distant, new species.

The genus *Ildefonsus* was erected by Distant (1910) for an Oriental lacebug, *Ildefonsus provorsus* Distant, 1910. The genus contains 5 species and occurs in the Oriental Region (Drake and Ruhoff, 1961; Tomokuni, 1981; Péicart, 1985, 2000). The northernmost distribution record of the genus is Xishuanbanna, Yunnan Province, China (Jing, 1981).

Tomokuni (1981) reported that *I. nepalensis* may be a moss feeder because the nymph and adult specimens were all collected from mosses which were pendulous on twigs of shrubs or grew in mat on slanting surfaces of the ground along a mountain-path. In our insect expedition to Southwest Hubei, China, the unique specimen of *Ildefonsus* was also collected from mosses on twigs of shrubs along a mountain-path. Lacebug genera fed on or lived in mosses usually have great species richness, such as *Acalypta* Westwood and *Cantacader* Amyot et Serville, so the genus *Ildefonsus* Distant should have more new taxa to be described in the future.

In revision on the Chinese Tingidae, the authors find some evidences in support of its monophyly of *Ildefonsus* Distant and one undescribed species. The definition of the genus, the description of the new species and a key to the species are given here.

The morphological terms of Drake and Davis (1960) are adopted in the present paper.

1 The Characters of *Ildefonsus* Distant

Body covered with long, slender and curved

hairs. Antennae clothed densely with long hairs, and the segment longer than 1/3 of segment . Bucculae closed in front. Head armed with 3 short spines: 1 pair of frontal spines and 1 dorsal+median one. Rostrum long, generally attending to or beyond the end of rostral sulcus; rostral sulcus opened behind; sternal laminae of rostral sulcus having 1 row of areolae. Postocular plates moderately large.

Hood inflated as an elliptical ball, overhanging on the head with eyes and antennal tubercles exposed. Pronotum moderately convex, tricarinate; median carina laminate, usually uniserial; lateral carinae lower than the median, uniserial. Paranotum much wide, semicircular and reflexed upwards. Hind triangular process short, areolate with areolae becoming larger posteriorly. Peritreme of metathoracic scent gland spoon-like with ostiole opened outwards and touching lateral margin of metapleurite. Propleurite with an antero-lateral smooth area.

Costal area of hemelytra wide or much wider; subcostal area narrow, nearly vertical to discoidal area, 1-2 rows of small areolae; discoidal area short, not surpassing 1/2 of hemelytron length. Hc (hypocosta) strongly bisinuate, R + M nearly parallel to Hc, Cu weak. Subgenital plate semicircular; pygophore with characteristic of trapezoid ventral wall extending backwardly.

The genus is well defined by the presence of 3 cephalic spines, narrowly inflated elliptical hood, 3 laminated carinae, semicircular paranota, arched front margin of hemelytron, wider costal area, shorter

discoidal area, bisinuate Hc and R + M, longer rostrum which almost reaching the end of rostral sulcus, spoon-like peritreme which having long canal, opened ostiole outwards with its outer margin touching the lateral margin of metapleurite and characteristic pygophore.

2 Species List of *Ildefonsus* Distant

Five known species and one newly described species herein of the genus may be divided into 2 groups based on the width of costal area. Those species and their distributions are listed as follow: provorsus-group (costal area with 3-4 rows of areolae): *Ildefonsus provorsus* Distant, 1910: India, China (Yunnan); *Ildefonsus nexus* Drake et Ruhoff, 1961: Burma, China (Yunnan); *Ildefonsus nepalensis* Tomokuni, 1981: Nepal. ampliatus-group (costal area with 6-10 rows of areolae): *Ildefonsus ampliatus* Péicart, 1985: Nepal; *Ildefonsus javanus* Péicart, 2000: Java; *Ildefonsus distanti* Li et Zheng, sp. nov., China (Hubei, Zhejiang).

3 Key to Species of *Ildefonsus* Distant

1. Costal area with 3-4 rows of areolae. provorsus-group 2
- Costal area with more than 5 rows of areolae. ampliatus-group ... 4
2. Subcostal area having 1 row or 1 row mixed with 2 rows of areolae *I. nexus* Drake et Ruhoff, 1961
- Subcostal area having 2 rows of regularly arranged areolae which larger in the upper row than in the lower 3
3. Paranotum with 4 rows of areolae; median carina much lower than hood *I. nepalensis* Tomokuni, 1981
- Paranotum with 3 rows of areolae; median carina subequal to hood in height *I. provorsus* Distant, 1910
4. Costal area much enlarged with 9-10 rows of areolae; subcostal area with 1 row of areolae *I. ampliatus* Péicart, 1985
- Costal area with 5-6 rows of areolae; subcostal area with 1-2 rows of areolae 5
5. Subcostal area with 1 row of areolae; lateral carinae subequal to median carina in height, with 1 row of large areolae *I. javanus* Péicart, 2000
- Subcostal area with 2 rows of areolae; lateral carinae much lower than median carina, with 1 row of small areolae *I. distanti* sp. nov.

4 Chinese Species of *Ildefonsus* Distant

4.1 *Ildefonsus nexus* Drake et Ruhoff New record to China (Figs. 1-5, 7, 8)

Ildefonsus nexus Drake and Ruhoff, 1961: 180.

Body testaceous, hemelytra and hind wings extending beyond the end of abdomen, areolae in hemelytra and paranota mostly with fuscous marks.

Vertex and antennae covered with white powder. Two frontal spines and 1 dorsal-median spine short and porrect, occipital spines absent. Bucculae closed

widely in front, with 3 rows of areolae. Rostrum extending to the front margin of second abdominal sternum (or just extending beyond rostral sulcus); rostral laminae of sternal sulcus uniserial, slightly arched outwards.

Hood narrowly inflated as an elliptical ball with a semicircular outline in lateral view, stretched forward and covered head except for eyes and antennal tubercles, 4 areolae deep in the highest part. Median carina lower than hood, uniserial with dorsal margin slightly arched (or nearly straight), conjunction between its dorsal margin and hood's dorso-posterior margin forming a distinctly obtuse angle; lateral carinae bisinuate, 1/2 as high as median carina, 1 row of areolae; pronotal disc fuscous, coarsely punctate; hind triangular process areolate, basal areolae small with veinlets testaceous, but apical areolae large with veinlets whitish yellow. Paranotum irregularly semicircular in shape, with 3 rows (all male individuals and some female ones) or 4 rows of areolae (some female individuals) wide. Peritreme of metathoracic scent gland spoon-like with ostiole opened outwardly and approaching lateral margin of metathoracic pleurite.

Hemelytra nearly elliptical with outer margin arched. Costal area with 2 rows of areolae at base, 1-2 rows at apex and 3 rows in middle; subcostal area nearly vertical to discoidal area and costal area, uniserial (4) or 1 row mixed with 2 rows of areolae (3 , 3), those additional areolae usually triangular-form or rectangular-form; discoidal area is slightly shorter than 1/2 of hemelytron, with 3-4 rows of areolae at widest part; sutural area with 3-4 rows of areolae which become larger toward the apex. Hc and R + M strongly bisinuate, R + M evidently thickened, Cu weak (slightly thicker than veinlets in discoidal and sutural areas); hypocostal laminae uniserial, extending to 7th abdominal segment () or genital segments ().

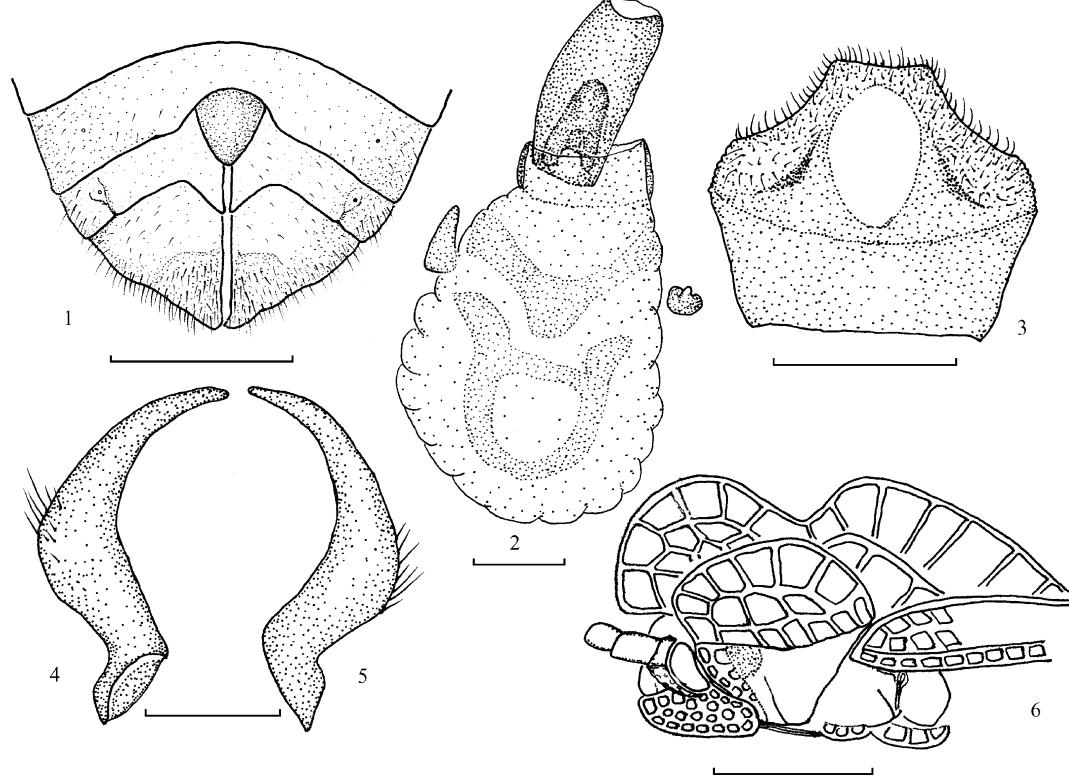
Paramere sickle-like with some bristles on its outer process. Pygophore with the ventral wall extending backwardly like a trapezoid, lateral margin of trapezoid slightly concave. Subgenital plate moderately large, semicircular in shape.

Specimens examined. 7 , 3 , Fenshuiling, Jinping County, Yunnan Province, China, alt. 2 000 m, 26 May 1996, collected by BU Wen-Jun (deposited in the Insect Collection of Nankai University, Tianjin, China).

Measurements (mm). Body length 3.57, width

1.70 (across the widest part in hemelytra); length of pronotum 1.47, hood 0.44, median carina 1.03, hemelytron 2.73, hemelytral discoidal area 1.15; antennal segments = 0.20 0.13 1.50 0.54.

Distributions. China (Yunnan); Burma.



Figs. 1-6. *Ildefonsus nexus* Drake et Ruhoff and *I. provorus* Distant. 1-5. *I. nexus*. 1. Female, abdominal apex, ventral view. 2. Phallus, dorsal view. 3. Pygophore, ventral view. 4. Left paramere, dorsal view. 5. Left paramere, ventral view. 6. *I. provorus*, head and thorax, lateral view. Scale bars: 1,3 = 0.2 mm; 2,4,5 = 0.1 mm; 6 = 0.5 mm.

4.2 *Ildefonsus provorus* Distant, 1910 (Figs. 6) *Ildefonsus provorus* Distant, 1910: 110.

Diagnosis. Bucculae closed narrowly in front. Pronotal paranotum regular semicircular, 3 rows of areolae in its widest part. Hood with a semicircular outline in lateral view, stretched forward and covered head except for eyes and antennal tubercles, 4 areolae deep in the highest part. Median carina well arched in front and nearly as high as hood, 1 row of large areolae with the conjunction nearly rectangular between its dorsal margin and hood's dorso-posterior margin. Lateral carinae distinctly lower than median carina, divergent posteriorly, with 1 row of areolae. Costal area with 3 rows of large areolae; subcostal area regularly arranged 2 rows of areolae with the upper areolae larger than the lower ones.

Specimens examined. 1, Laiyanhe (Simao, Yunnan Province, China), alt. 1400 m, 21 May

Remarks. The 10 specimens from Yunnan are mostly in accorded with the origin description of *I. nexus*, but having longer rostrum which extends slightly beyond the rostral sulcus (to the front margin of second abdominal sternum).

2000, collected by ZHENG Le-Yi (deposited in the Insect Collection of Nankai University, Tianjin, China).

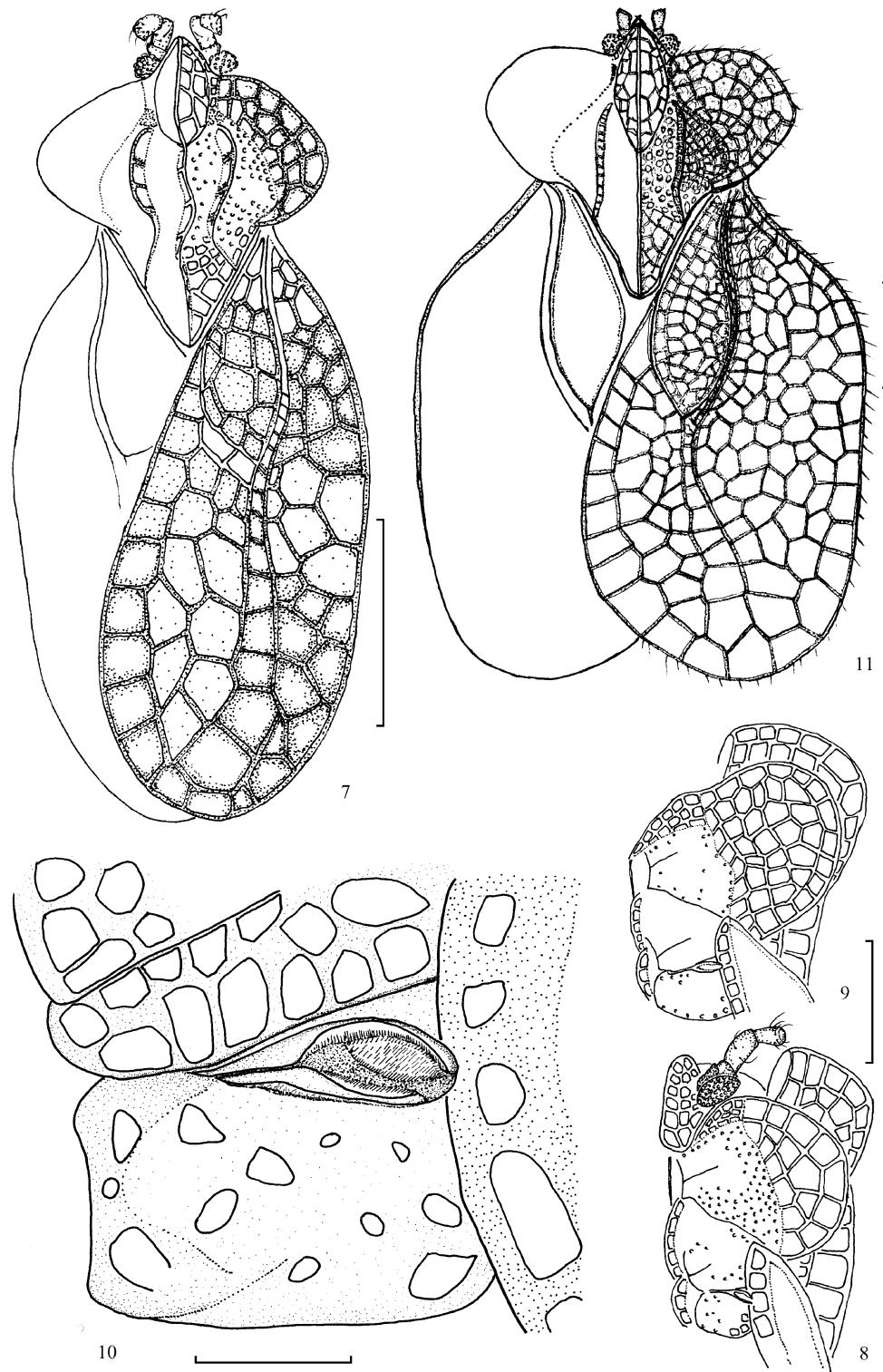
Measurements (mm). Body length 3.32, width 1.78 (across the widest part in hemelytra); pronotum length 1.51, width 1.34; length of hemelytron 2.33, discoidal area 1.13; antennal segments = 0.88 0.38.

Distributions. China (Yunnan); India.

4.3 *Ildefonsus distanti* sp. nov. (Figs. 9-11)

Body testaceous, cephalic spines pale yellow, pronotal disc, calli and the base of hind triangular process dark brown. Compound eyes reddish brown. All parts of pronotum and the basal part of costal and subcostal areas densely clothed with pale hairs on their veinlets.

Antennal segments clothed with pubescence, segments and also clothed densely with erected



Figs. 7-11. *Ildefonsus nexus* Drake et Ruhoff and *I. distanti* sp. nov. 7. *I. nexus*, adult, dorsal view. 8. *I. nexus*, head and thorax, lateral view. 9. *I. distanti*, head and thorax, lateral view. 10. *I. distanti*, peritreme of metathoracic scent gland. 11. *I. distanti*, adult, dorsal view. Scale bars: 7,10 = 1.0 mm; 8,9,11 = 0.5 mm.

bristles. Head armed with 3 cephalic spines, frontal spines porrect inwardly with the tips crossed each other and exposed from hood; dorsal-median spine appressed with the apex reaching base of frontal spines. Antennal tubercles small, not spine-like. Bucculae triangular,

not meted in front of rostrum, triseriate wide. Rostrum reaching hind edge of 3rd abdominal sternum (or 2nd visible abdominal sternum), rostral laminae of sternal sulcus thickened with a row of large areolae. Rostral sulcus opened behind. Metathoracic scent gland with

orifices opened on each side of metacoxal cavities, peritreme spoon-like with the outer margin reaching lateral margin of metapleurite and opened outwards just like the other species of the genus.

Hood narrowly inflated as an elliptical ball and slightly wider than interocular space, with a semicircular outline in lateral view, stretched forward and covered head except for eyes and antennal tubercles. Median carina lower than hood, uniserrate with straight dorsal margin, conjunction between its dorsal margin and hood's dorso-posterior margin forming a distinctly obtuse angle; lateral carinae slightly sinuate, 1/2 as high as median carina, with 1 row of small areolae. Paranotum semicircular, with 6 areolae at its widest part. Pronotal disc moderately convex, coarsely punctate; hind triangular process areolate with larger areolae toward posteroir margin.

Hemelytra large and wide with outer margin abruptly widened. Costal area with 7 rows of areolae at widest part, subcostal area with 2 rows of small areolae, discoidal area slightly shorter than 1/2 of hemelytron, 5 areolae wide with veinlets much thin and weak. Cu same thick as R + M with the boundary between discoidal and sutural areas clearly defined. Sutural area tri- or quadriseriate.

Type materials. Holotype, Maoba Town, Lichuan County (29.9° N, 108.5° E), Hubei Province, China, alt. 750 m, 28 July 1999, collected by LI Chuan-Ren. Paratypes 1, Baishanzu, Qianyuan County, Zhejiang Province, China, 20 Aug. 1993, collected by WU Hong; 1, Tianmu Mountain, Zhejiang Province, China, 10 Sept. 1993.

Etymology. The specific name *distanti* is named after famous hemipterist W. L. Distant in honor of his contributions to tingid fauna of the Oriental region.

Measurements (mm). Holotype, body length 3.53, width 2.31; antennal segments = 0.17 0.13 1.21 0.48; pronotum length 1.49, width

(including paranota) 1.68; hemelytron length 2.56, width 1.41; length of discoidal area 1.17. Paratype : antennal segments = 0.17 0.13 1.35 0.51. Paratype : body length 3.46, width 2.31; pronotum length 1.53, width 1.74; length of hood 0.67; hemelytron length 2.52, width 1.43; length of discoidal area 1.17.

Remarks. The new species belongs to *ampliatus*-group because of having much wider costal area. In *ampliatus*-group, only 2 species had been recorded in the world, ie. *Ildefonsus ampliatus* Péicart, 1985 and *Ildefonsus javanus* Péicart, 2000. *I. distantii* sp. nov. can easily be distinguished from *ampliatus* Péicart by relatively narrower paranotum and costal area, the latter having 9-10 rows of areolae in costal area and 7-8 areolae deep in paranotum. The new species is closely allied to *javanus* Péicart, but the latter having narrower hemelytron (only 1/2 of hemelytron length), uniserrate subcostal area, higher lateral carinae and characteristic hood outline in lateral view.

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污网蝽属记述及一新种描述 (半翅目, 网蝽科)

李传仁¹ 郑乐怡²

1. 长江大学农学院 湖北荆 434025

2. 南开大学生命科学学院 天津 300071

摘要 补充头刺、后胸臭腺和生殖节等特征后重新定义了东洋区特有属—污网蝽属，并确认该属单质。记述中国污网蝽属昆虫3种，其中狄氏污网蝽 *Ildefonsus distantii* 为新种。

关键词 半翅目, 网蝽科, 污网蝽属, 新种。

中图分类号 Q969.355.3

窄污网蝽 *Ildefonsus nexus* Drake et Ruhoff 为中国新纪录种。文中给出了污网蝽属名录及种类检索表。新种的模式标本保存于南开大学昆虫标本室。